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January 30, 2006

Mark Shaw, Esq.
MacDonald, Illig, Jones & Britton
100 State Street
Suite 700
Erie, PA 16507

Dear Attorney Shaw:

As counsel for the Millcreek Township Sewer Authority (MTSA) and Millcreek Township (MT) you requested me to provide expert testimony regarding the adequacy of the projects being implemented by the MTSA and MT pursuant to the 2003 Consent Order and Agreement (COA), which includes the design and construction of facilities to remove the Kearsarge pump station's and its tributary sewer system's overflows.

My employer, Metcalf & Eddy, Inc./AECOM, is being compensated for my time at a rate of \$158.77.

QUALIFICATIONS

A. Education

I am a registered Professional Engineer in the State of Pennsylvania and have a Bachelor of Science and a Master of Science degree in sanitary engineering from the Pennsylvania State University. My applicable course work included sewer and pump station design, wastewater treatment theory, and microbiology in addition to normal civil engineering course work. My Bachelor's degree was obtained in 1964 and my Masters in 1972.

B. Work Experience

I worked for the PA Department of Environmental Protection (then the PA Department of Health and the PA Department of Environmental Resources) from 1965 to 1972 (except for 1-1/3 years spent working on my Masters). During that time I served as Chief of the Planning, Operations, and Facilities Sections in three different regional offices ending with the Meadville Regional Office.

From 1972 to 1976 I worked with the Erie County Health Department as Director of Sanitary Engineering which included supervision of staff performing the same functions delineated above, plus supervising the onlot disposal and solid waste disposal programs.

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From 1976 until 2005 (October) I worked for Consoer Townsend Envirodyne Engineers/AECOM (originally Consoer Townsend & Associates) in their Erie office beginning as an Associate and ultimately as the Business Unit Manager. During that time I worked with sewer collection and treatment, water distribution and treatment, and solid waste management for up to eleven municipal clients including the Millcreek Township Sewer Authority. I also represented the Erie Sewer Authority on the Lake Erie Lake Management Plan Forum Committee and the Presque Isle Bay RAP Policy Advisory Committee.

In October, 2005, the Erie office was moved to the control of Consoer Townsend's sister AECOM company, Metcalf & Eddy/AECOM. The Erie office's clients and responsibilities remain the same but we report to a different hierarchy. My title is now Business Unit Leader. The same staff works on Millcreek.

REPORT

Kearsarge Pump Station Modifications

History

The Millcreek Township Sewer Authority's Kearsarge pump station was initially constructed in 1958. In the early 80's it was recognized that flows into the pump station exceeded its capacity resulting in gravity overflows to Walnut Creek, the volumes of which were unknown. The station and force main were expanded with discharge into the City at Manor Drive on the west side of Erie in 1984.

Despite the 1984 upgrade, the Kearsarge Pump Station continued to have capacity problems. In 1992, the MTSA and MT entered into a Consent Order and Agreement (1992 COA) to address the capacity problems at the Kearsarge Pump Station and in other areas of the Millcreek sewer system. Also, at this time, the City of Erie was evaluating capacity problems that it was experiencing. At the time, it was determined that the problem with the solution at Kearsarge was that flows from Kearsarge could not be increased without exacerbating the City of Erie's capacity problems. As part of that 1992 COA, the MTSA submitted two alternative solutions to this problem: one involved constructing a new sewer line directly from the Millcreek system to the City of Erie WWTP; the other involved constructing a series of sewer system projects in conjunction with the City of Erie improvements that would increase the capacity that could be accepted by the City from Millcreek. Both alternatives were presented to the DEP, and both the MTSA and the DEP preferred the alternative of working with the City of Erie. The alternative of working with the City of Erie was the alternative selected.

Ultimately by 2000, all of the projects under the 1992 COA were completed, except the removal of the Kearsarge bypass. Unfortunately, despite spending millions of dollars and significantly increasing the capacity that could be accepted by the City, the capacity available for Kearsarge did not increase. Initially, the MTSA thought it could improve the capacity problem by performing I&I work. The DEP, however, rejected that effort and required the MTSA and MT to enter into the 2003 COA.

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The 2003 COA required as a first step the completion of a special study report defining the anticipated flows and methods for handling those flows to allow the elimination of the overflow. That report (prepared by the writer) found the existing flows entering the City during major flow events were approximately equal to the limits found in the City's agreement with the MTSA and upon which the City designed their system upgrade. Thus, the additional flow rates required to be sent forward to the City to allow the overflow to be eliminated would create exceedances during storm or high flow events. Thus, it was concluded that overflow detention and feed back into the system was the necessary design to allow the overflow to be eliminated.

The conceptual design of the overflow was based on past flow and rainfall. I reviewed past flow records at the station during high flow periods when overflows had been recorded. I also reviewed rainfall data that was obtained from NOAA records of observations at the Erie Airport on those same dates. I related them to a storm frequency. In addition, observations of present day overflows were made at the station in attempts to confirm past data and those flows were related to rainfall data from up to four additional rainfall recording stations [Erie (2), Summit (1), and Millcreek (1)].

Since the PA DEP does not define a design storm or condition to be used in sizing facilities, just that overflows should be prevented, several conceptual storage volume designs representing different storm frequencies were presented with a recommended alternative storage volume which was ultimately accepted. This analysis is contained in the Special Study. The Department approved the Special Study on September 29, 2004.

However, just prior to the Department's approval of the Special Study, the Millcreek area was hit on consecutive weekends by the remnants of two different hurricanes. The largest of those storms (September 9th) had frequency of occurrence of 40 to 50 years. Due to the large volume of flows witnessed at the Kearsarge Station from these two storm events, the MTSA and MT reevaluated the design that was approved by the DEP. As a result, the MTSA and MT submitted an addendum to the Special Study that relied upon the new data, which recommended a much larger overflow retention facility. This addendum is entitled Act 537 Special Study Addendum.

This resulted in a design forward flow rate of 4,500 gpm, storage flow rate of 4,500 gpm, and a storage volume of 2.3 mg with a contingency to allow an increase in forward flow rates and storage flow rates if they become absolutely necessary to prevent sewer backup and flooding.

Design

The existing forward pumps will be replaced with pumps with a two pump design capacity of 4,500 gpm capacity.

The overflow retention tank design includes two 65 ft. high by 56 ft. diameter units described in the Authority's second addendum to the Special Study. The units combined are sized at 2.3 mg and are dimensioned to be placed on the available land near the pump station. (Remote location requires that

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pump station overload be anticipated where as near locations allow reaction to an actual overload.) A 4,500 gpm submersible storage pump station is to be constructed to transfer excess flows to the storage facility. One standby unit will be provided in each pump station. The system will be further modified to provide a new generator (old is standby), automatic transfer switch, new inlet power, a SCADA system (remote alarms, etc.), a new flow meter, and removal of the overflow.

The system will operate as follows: as flows enter the station and exceed system capacity, they will back up into the wet well until they reach the diversion sewer protected by a baffle to prevent entry of floatables; flows will be transported to the submersible pump station; the submersible pump station will be activated by floats (in the event they are not activated, alarms will alert personnel and the governor will disconnect to allow forward pump capacity to be increased); submersible pumps will transfer flows to the storage tanks (level will be monitored with alarms if capacity is approached).

Once flows return to normal, an automatic valve will open to allow tanks to drain. The valve will modulate to allow flows to be maintained at or below forward pump capacity (by immediately emptying, the tanks will be available in the event of an immediate repeat storm).

In my professional opinion, the overflow retention basin is adequately and properly designed to handle the overflow at the Kearsarge Station and to allow the MTSA and MT to remove the bypass.

Sewer System UpGrade

In addition to the overflow retention basin, the MTSA and MT has and is making improvements to the sewer system that is tributary to the Kearsarge Station. This additional work included the Zimmerly Relief Sewer, the Beaver Run/Peach Street Relief Sewer and backflow preventers.

The Zimmerly Relief Sewer was needed to alleviate localized sewer backups that occurred in that sewer line due to the flow in the line being over the capacity of the line. These sewer backups caused sewage to enter into people's basements. As a result, the Zimmerly manhole would be pumped to avoid flooding people's basements. The Zimmerly Relief Sewer was completed in the fall of 2004 and the Zimmerly manhole has not been pumped since then, and it is my professional opinion that the Zimmerly manhole will not need to be pumped due to lack of sewer capacity in the foreseeable future.

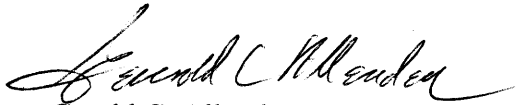
The Beaver Run/Peach Street Relief Sewer also is designed to help alleviate localized overflows in the area downstream of the relief sewer. Like Zimmerly, the existing Beaver Run sewer line is over capacity during peak flow events. As a result, there have been times that the manholes at Larchmont and Church had to be pumped to avoid backups of sewage into people's basements. The relief will divert flows from the Beaver Run Sewer relieving its overload condition. As a interim solution until the relief sewer can be constructed, the MTSA and MT have focused their I&I efforts in this area, and have implemented a procedure whereby flow in a Peach Street manhole will be diverted by pumps during storms to another section of the sewer system to reduce the surcharge at Larchmont and Church. There have not been any overflows from the manholes at Larchmont and Church since December,

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2004, and, in my profession opinion, the quantity of diverted waters should be sufficient to prevent the need to pump the manholes at Larchmont and Church in the foreseeable future.

It is my understanding that the MTSA and MT also have completed the installation of all needed backflow preventers. Ultimately, it was decided that even with the new overflow detention tanks, there remained some risk of basements becoming flooded. In my professional opinion, properly functioning backflow preventers eliminate that risk.

Very truly yours,

A handwritten signature in cursive script, appearing to read "Gerald C. Allender".

Gerald C. Allender, P.E.
Business Unit Leader

GCA:lb

**EXHIBITS TO
EXPERT REPORT OF GERALD C. ALLENDER, P.E.**

<u>EXHIBIT NO.</u>	<u>DESCRIPTION</u>	<u>DOCUMENT NO.</u>
1	MTSA Sewage Flow Studies (Existing and Future)	CT5 0001-00024
2	MTSA Sewage Flow Studies Addendum	CT5 00025-00031
3	Task Activity Report	MSA-MT 0859-0866
4	1992 Consent Order and Agreement	MSA-MT 6750-6772
5	Millcreek Township Sewer Authority, Alternative Selection and Implementation Schedule, Sewage Facilities Plan (7/31/92)	MSA-MT0901-1098
6	Millcreek Township Sewer Authority, Summary Alternative Selection and Implementation Schedule, Sewage Facilities Plan (3/26/93)	CT7 00038-00066
7	DEP Letter Approving Alternative B	CT7 00036-00037
8	Overflow Abatement Alternatives Report (8/13/03)	MSA-MT1333-1363
9	2003 Consent Order and Agreement	MSA-MT6773-6796
10	Act 537 Special Study	MSA-MT2139-2599
11	DEP Approval of Special Study (9/30/04)	DEP00627-00628
12	Act 537 Special Study Addendum	MSA-MT2803-2947
13	DEP Approval of Special Study Addendum (7/12/05)	DEP00554
14	PaDEP Water Quality Management Permit No. 2583409)9/26/05)	DEP00545-00552
15	Project Manual 12/2005	MSA-MT6797-7516
16	Kearsarge Pump Station Upgrade Contract Documents, Sheet CO2-A	MSA-MT7520
17	Kearsarge Pump Station Upgrade Contract	MSA-MT7522

**EXHIBITS TO
EXPERT REPORT OF GERALD C. ALLENDER, P.E.**

	Documents, Sheet CO3	
18	Kearsarge Pump Station Upgrade Contract Documents, Sheet PO3	MSA-MT7530
19	Kearsarge Pump Station Upgrade Contract Documents, Sheet PO4	MSA-MT7531
20	Kearsarge Pump Station Upgrade Contract Documents, Sheet PO5-A	MSA-MT7533
21	Kearsarge Pump Station Upgrade Contract Documents, Sheet PO6-A	MSA-MT7535
22	Kearsarge Pump Station Upgrade Contract Documents, Sheet PO7-A	MSA-MT7537

IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF PENNSYLVANIA

ERIE COUNTY ENVIRONMENTAL
COALITION, PENNENVIRONMENT,
INC. and THE GAIA DEFENSE LEAGUE,
Plaintiffs

v.

MILLCREEK TOWNSHIP SEWER
AUTHORITY AND MILLCREEK
TOWNSHIP,
Defendants

CIVIL ACTION NO. 05-59 ERIE

INDEX OF DOCUMENTS
CONSIDERED BY GERALD C. ALLENDER, P.E.*

<u>DOCUMENT NO.</u>	<u>DESCRIPTION</u>
1	MSA-MT 0001 - MSA-MT 7561
2	CT5 0001 - CT20 00362
3	DEP 0001 - DEP 00637

* Please note that Mr. Allender is the consulting engineer for the Millcreek Township Sewer Authority and, therefore, his knowledge and the documents he has considered in forming his opinions essentially include most of the documents produced by defendants to date. The key documents have been identified as Exhibits to his expert report.